AQUATIC PLANT MANAGEMENT IN GEORGIA POWER COMPANY RESERVOIRS

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PROBLEM

Georgia Power Company (GPC) operates 14 reservoirs covering 57,905 acres. Six reservoirs are located in the Mountains, seven are in the Piedmont, and one is in the Coastal Plain. This presentation will summarize the aquatic plant management activities in GPC Reservoirs.

These reservoirs are susceptible to colonization by noxious exotic aquatic plants, such as Waterweed (Egeria densa) and Eurasian water-milfoil (Myriophyllum spicatum). These and other nuisance aquatic plants can be found in company reservoirs and in adjacent reservoirs. At least 58 species have been found in GPC reservoirs (Table 1). Once these plants become well established, eradication is not feasible in most cases. Control measures are expensive and can interfere with recreational use of the reservoir. Early detection and prompt control measures prior to establishment of exotic aquatic plants will result in lower management costs.

GPC's goals for aquatic plant management are to prevent the spread of noxious aquatic plants, allow optimum recreational use, and minimize operational problems with aquatic plants at generating units.

Table 1. Scientific and Common Names of Aquatic Plants Found in Georgia Power Company Reservoirs

Scientific Name	Common Name
Alternanthera philoxeroides	Alligator Weed
Arundo donax	Giant Reed
Carex crinita	Sedge
Carex sp	Sedge
Ceratophyllum demersum	Coontail
Chara sp	Musk-Grass
Commelina diffusa	Day Flower
Cuscuta sp	Dodder
Cynanchum laeve	Sandvine
Cyperus sp	Flat Sedge
Dulichium arundinaceum	Three-Way Sedge
Egeria densa	Waterweed
Eichhornia crassipes	Water Hyacinth
Eleocharis baldwinii	Slender Spikerush
Eleocharis obtusa	Slender Spikerush
Eleocharis quadrangulata	Square-Stem Spikerush
Eleocharis sp	Spikerush
Hydrocotyl umbellata	Water Pennywort
Hydrolea quadrivalis	Hydrolea
Juncus sp	Rushes
Justicia americana	Water Willow
Justicia ovata	Justicia
Ludwegia brevipes	Evening Primrose
Ludwegia peploides	Water Primrose
Ludwegia sp	(Marginal Plant)
Lyngbya sp	Algae
Manisuris rugosa	Joint Grass
Micranthemum glomeratum	Baby Tears
Myriophyllum aquaticum	Parrot's Feather
Myriophyllum heterophyllum	Variable Leaf Milfoil
Myriophyllum spicatum	Eurasian Water-Milfoil
Najas guadalupensis	Southern Naiad
Najas minor	Spinyleaf Naiad
Nelumbo lutea	Yellow Lotus
Nuphar luteum	Spatterdock
Nymphaea odorata	Fragrant Water Lily
Nymphoides aquatica	Banana Lily
Panicum hemitomun	Maidencane
Peltandra virginica	Green Arum
Pithophora sp	Algae
Polygonum sagittatum	Tear Thumb
Pontederia cordata	Pickerel Weed
Potomogeton diversifolis	Pondweed
Potomogeton illinoensis	Pondweed
Potomogeton sp	Pondweed
Saggitaria lancifolia	Duck Potato
Saggitaria latifolia	Duck Potato
Saururus cernuus	Lizard's Tail
Scirpus californicus	Giant Bulrush
Scirpus cyperinus	Woolgrass Bulrush
Scirpus sp	Bulrush
Scirpus validus	Soft-Stem Bulrush
Sparganium americanum	Bur Reed
Typha sp	Cattail
Utricularia sp	Bladderwort
Vallisneria americana	Tape-Grass
Vernonia gigantea	Ironweed
Zizaniopsis miliacea	Giant Cutgrass

METHODS

Yearly surveys are performed to identify the aquatic plants present in each reservoir. Maps are marked to indicate the locations and types of aquatic plants found in the surveyed areas. A database of aquatic plants and dates found is maintained for each reservoir. Where possible, management of nuisance aquatic plant populations is coordinated through the Georgia DNR, Game & Fish Division's (Game & Fish Division) Aquatic Plant Control Work Plan.

Five GPC reservoirs (Goat Rock, Jackson, Juliette, Seed, Worth) are presently receiving aquatic plant management efforts. Chemical, physical, and biological controls are utilized. Only EPA approved herbicides are applied by state licensed aquatic pest control applicators. All of these reservoirs, except Lake Seed, are joint- ly managed with the Game & Fish Division. Total acreage planned for treatment in 1991 is noted in Table 2.

Table 2. Total Acreage Planned for Treatment in GPC Reservoirs during 1991.

Reservoir	Acres	(Target Plants)	% Total Reservoir Acreage
Burton	---		0
Goat Rock	---		0
Harding	---		0
Jackson	60	(Alligator Weed, Giant Cutgrass and Pithophora)	3
Juliette	47	(Eurasian Water-milfoil)	1
Oconee	---		0
Oliver	---		0
Rabun	---		0
Seed	24	(Bladderwort and Parrot's Feather)	10
Sinclair	5	(Giant Cutgrass)	<1
Tallulah Falls	---		0
Tugalo	---		0
Worth	156*	(Giant Cutgrass, Variable-leaf milfoil, Water Hyacinth)	11

* Approximately 100 acres of Lyngbya are being evaluated for control by winter drawdown and biomass removal. The remaining 56 acres targeted for chemical control represent 4% of the total reservoir.

RESULTS AND DISCUSSION

Goat Rock Reservoir

Waterweed, or Brazilian elodea, has grown in Goat Rock Reservoir since at least 1983. By 1987, rafts of this plant caused generation losses by blocking hydroelectric intakes. Resi- dent's docks were inaccessible in some coves. In 1989, three herbicides (Sonar, Komeen, Cutrine-Plus) were used on five test plots covering 82 acres. Komeen was found to be most cost effec- tive for this system, and was re-applied in 1990 to the three uplake test plots. Results of these control efforts are noted in Table 3. Due to the successful control results in 1990, only survey work is planned in 1991 to evaluate regrowth of the waterweed.

Lake Jackson

The South and Yellow River arms of Lake Jackson have had significant infestations of alligator weed, giant cutgrass, and Pithophora since 1979 (GA DNR, 1979). Alligator weed and giant cutgrass blocked access to banks and docks, while Pithophora formed extensive surface mats in shallow areas. In 1990, 60 acres of alligator weed and giant cutgrass were treated with Rodeo, and 60 acres of Pithophora were treated with Cutrine-Plus (GA DNR, 1990). Flea beetles (Agasicles hygrophila) were stocked in located not treated with herbicides in 1988 to control alligator weed. Control effort in 1991 will be reduced by 50% due to success of previous treatments.

Lake Juliette

The Dames Ferry public recreation area of Lake Juliette was treated with Diquat in 1983 (GA DNR, 1983) to reduce infestations of Brazilian elodea, musk-grass, and spiny leaf naiad. It is believed these plants are now controlled by the natural summer water level drop caused by increased oper- ation of Plant Scherer.

In 1989, another aquatic plant, Eurasian water-milfoil, was found by the Game & Fish Division in the lake, and by Plant Scherer opera- tions personnel in the adjoining 1,050 acre ash pond system. Part of the ash pond system (300 acres) was stocked with triploid grass carp in November, 1989, by Plant Scherer. Both GPC and Game & Fish Division personnel have been search- ing the lake shoreline at 4-6 week intervals during the growing season (May - October) to locate water-milfoil colonies. A 1/4 acre plot around each colony is treated with Aqua-Kleen to prevent further spread of this plant. In 1989, 16 3/4 acres were treated, and in 1990, 25 3/4 acres were treated. Plant Scherer's ash pond system will be treated in 1991, in addition to Lake Juliette. Success of this control approach will be determined in the 1991 growing season.

Lake Seed

Parrot's feather and bladderwort were found in Lake Seed in 1988. By 1989, these plants were interfering with recreational use of the lake, and 24 acres were treated with Diquat. Seasonal control was obtained for the parrot's feather, with no apparent reduction in the

Table 3. Goat Rock Reservoir Egeria Treatment Evaluation.

1989	Treatment Area (Acres)	Herbicides	PreTreatment Coverage(%)	Treatment Date	Post Treatment Coverage(%) Two Weeks	Seven Weeks
			07-12-89		08-31-89	10-05-89
	2 (21)	Sonar SRP	64	08-17-89	53	92
	3 (7)	Komeen	72	08-17-89	67	78
	5 (18)	Cutrine Plus	76	08-17-89	42	22
	1 (13)	Sonar As + Komeen	60	08-17-89	43	50
	4 (23)	Komeen	87	08-17-90	50	56

1990			03-01-90	05-31-90	06-14-90	Six Weeks 07-26-90
	2 (21)	Komeen	58	72	06-14-90	0
	3 (7)	Komeen	36	50	06-14-90	19
	5 (18)	Komeen	8	11	06-14-90	0
	1	None	11	8	----	0
	4	None	17	0	----	0
	Uplake Control	----		26	----	37

bladderwort population. In 1990, Aqua-Kleen was applied to the same area to obtain seasonal control of both plants. A similar effort is expected in 1991.

Lake Worth

Giant cutgrass and water hyacinths have been receiving treatment efforts in Lake Worth since at least 1979 (GA DNR, 1979). Regular treatments with Rodeo are maintaining these two plants at non-nuisance levels. However, Lyngbya, which has been receiving treatment efforts since 1984 (GA DNR, 1984), is still forming extensive surface mats in the lake. Winter lake drawdowns with Lyngbya biomass removal are under evaluation for control of this nuisance plant in 1991.

Public Awareness

GPC and the Game & Fish Division developed a brochure in 1990 describing three noxious exotic plants (Brazilian elodea, Eurasian water-milfoil, and Hydrilla). This brochure will be distributed across the state. It requests public assistance to identify locations of these exotic plants to GPC and Game & Fish Division personnel, and to prevent the spread of these plants to other reservoirs.

CONCLUSIONS

Herbicides, lake drawdowns and biological controls are currently used to manage nuisance aquatic plants in GPC reservoirs. Brazilian elodea in Goat Rock Reservoir was reduced to non- nuisance levels in 1990. Successful control of Eurasian water-milfoil in Lake Juliette and Plant Scherer's ash pond system will require continuing efforts in 1991. Public assistance is sought in identifying noxious aquatic plants and preventing their spread to other reservoirs.

LITERATURE CITED

GA DNR, Game & Fish Division, FY 1979-1990. Annual Reports, Public Waters Management Program.